

Name: _____

at1118paper: Complete the Square (v411)

Example

By completing the square, find both solutions to the given equation:

$$x^2 - 38x = -325$$

Add $\left(\frac{-38}{2}\right)^2$, which equals 361, to both sides of the equation.

$$x^2 - 38x + 361 = 36$$

Factor the left side.

$$(x - 19)^2 = 36$$

Undo the squaring. We need to consider both $\pm\sqrt{36}$.

$$x - 19 = -6$$

$$x = -25$$

or

or

$$x - 19 = 6$$

$$x = -13$$

Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 34x = -240$$

$$x^2 - 34x + 289 = 49$$

$$(x - 17)^2 = 49$$

$$x - 17 = \pm 7$$

$$x = 10 \quad \text{or} \quad x = 24$$

Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 22x = -120$$

$$x^2 + 22x + 121 = 1$$

$$(x + 11)^2 = 1$$

$$x + 11 = \pm 1$$

$$x = -12 \quad \text{or} \quad x = -10$$

Question 3

By completing the square, find both solutions to the given equation:

$$x^2 - 40x = 624$$

$$x^2 - 40x + 400 = 1024$$

$$(x - 20)^2 = 1024$$

$$x - 20 = \pm 32$$

$$x = -12 \quad \text{or} \quad x = 52$$

Question 4

By completing the square, find both solutions to the given equation:

$$x^2 + 40x = 384$$

$$x^2 + 40x + 400 = 784$$

$$(x + 20)^2 = 784$$

$$x + 20 = \pm 28$$

$$x = -48 \quad \text{or} \quad x = 8$$

Question 5

By completing the square, find both solutions to the given equation:

$$x^2 - 10x = 200$$

$$x^2 - 10x + 25 = 225$$

$$(x - 5)^2 = 225$$

$$x - 5 = \pm 15$$

$$x = -10 \quad \text{or} \quad x = 20$$

Question 6

By completing the square, find both solutions to the given equation:

$$x^2 - 36x = -275$$

$$x^2 - 36x + 324 = 49$$

$$(x - 18)^2 = 49$$

$$x - 18 = \pm 7$$

$$x = 11 \quad \text{or} \quad x = 25$$